



A Culture of Innovation

3M



A Culture of Innovation

For more than a century, innovation has been the hallmark of 3M's growth, reflecting a culture of shared ideas and technology. Innovation enables 3M to continuously deliver practical and ingenious solutions to everyday problems around the world on a daily basis.

Research & Development: 3M invests generously in research & development to fuel the innovation pipeline.

Throughout history, many great thinkers have embraced the maxim that the best way to predict the future is to create it. In this regard, 3M's business model is to foster organic growth by inventing new products that previously did not exist. This business model has led not only to new products, but also the creation of new industries, such as coated abrasives, pressure sensitive tapes, nonwoven respirators and fluoromaterials. In order to foster such growth, the company recognises the value of Research & Development (R&D) and allocates approximately six per cent of its annual revenue to R&D.



The 3M™ Littmann® Electronic Stethoscope Model 3200 uses Bluetooth® technology to wirelessly transfer heart, lung and other body sounds to software for further analysis.



Large Aperture Trough (LAT) 73 uses 3M™ Solar Mirror Film 1100 as a reflective surface and a frame support structure custom designed by Gossamer Space Frames. The result is an easy to assemble parabolic trough collector with the largest working aperture and the highest geometric concentration ratio in the world today.



3M tinkered with 3M™ Scotchlite™ Reflective Material for eight years before perfecting the technology. Over the decades, its uses multiplied and spurred the creation of its own division in 1943, grossing about \$10 million by 1953. Today, Scotchlite reflective material is still a profitable product for 3M's Safety and Graphics Business, as well as for the Industrial Business.

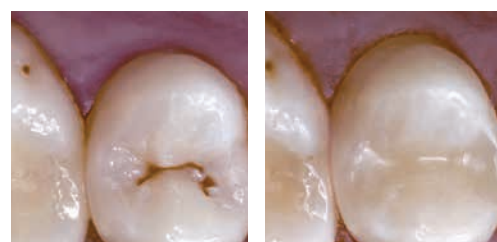
Bold Talent:

3M encourages risk-taking and persistence.

In today's fast-paced, pressure-packed business climate, many companies take a very short-term approach to the new product development pipeline. Because innovation does not occur on a set timeline, 3M takes a different path — thanks in large part to the principles that former CEO, William L. McKnight instilled in the company. McKnight believed in the imperatives of hiring the right people, tolerating mistakes and giving employees freedom to explore in order to foster a culture of innovation. 3M has put the McKnight Principles into practice by encouraging employees to dedicate a significant portion of their time to projects and research that go beyond their core responsibilities. Although it may take years for such innovative “tinkering” to bear fruit, the results of 3M's 15 Per Cent culture are truly remarkable. Examples include Scotch® Brand Tapes, Post-it® Notes, Scotchgard™ Fabric Protector, automobile window treatment films, multilayer optical films and silicon adhesive systems for transdermal drug delivery.



3M Corporate Scientists utilised 3M's 15 Per Cent Time and Genesis Grants to invent Multilayer Optical Films. 3M's Multilayer Optical Films have grown into an entire light management technology platform that is utilised in multiple 3M products.



Filtek™ Supreme, a dental product that easily matches natural tooth colour, was a huge risk for 3M because it utilised nanotechnology at a time when its success was largely unproven. The risk paid off. 3M is now a leading dental composite provider around the world.

Diverse Technologies: 3M creates uncommon connections with access to multiple 3M technologies.

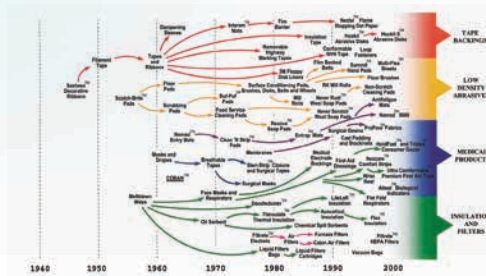
No company can match the breadth and depth of 3M's more than 46 technology platforms in as many combinations, for as many purposes across as many geographies. With more than 55,000 products, 3M continues to demonstrate an uncanny ability to combine highly innovative technologies in new and unexpected ways. Imagine dental technology applied to car parts, or nonwoven technology incorporated into kitchen cleaning tools and respirators. 3M has also pioneered unique ways to migrate its microreplication, adhesives and a multitude of other technologies to develop innovative solutions to everyday problems. While such innovation often yields end-user products, 3M's rich pool of technology is also incorporated into a vast array of solutions developed by outside partners, making their products more innovative and their businesses more successful.



3M initially developed the Pentamix™ Automatic Mixing Unit technology for dental application with crown mouldings. Recognising that such technology could be applied to solve similar challenges in automotive body shops, 3M shared this technology across divisions. 3M Dynamic Mixing System is now a highly profitable product line for 3M's automotive business.

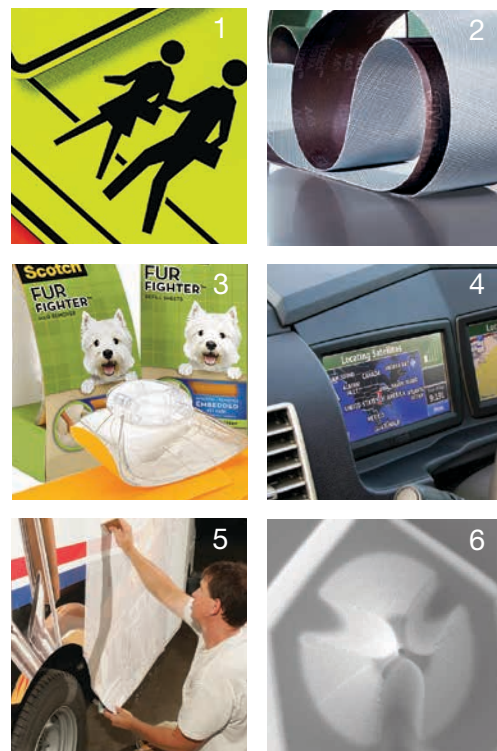
3M Nonwoven Technology Platform

Over the years, the 3M Nonwoven technology platform has migrated across several industries and has been applied to create hundreds of 3M products.



Microreplication at 3M

Microreplication has spread to virtually every business in 3M. Here are some examples:



1 Reflective materials (such as 3M™ Diamond Grade™ Reflective Sheeting) **2** Abrasives (3M™ Trizact™ Abrasives) **3** Scotch™ Fur Fighter™ Hair Remover **4** Various optical films (3M™ Brightness Enhancement Film) **5** Adhesives (3M™ Comply™ Adhesive used in graphics and automotive blackout films) **6** Microneedles used in transdermal drug delivery products



Robust Network:

3M scientists share ideas
and practices on a global scale.

Applying innovative technology across a global company as diversified as 3M presents not only great opportunity, but also substantial challenge. As a company with 88,000 employees and operations in more than 70 countries worldwide, new developments are happening every day. That's why communication plays as important a role as technical skill – enabling innovation to flourish without boundaries. For example, members of 3M's science community ignite the engine of innovation through the 3M Technical Forum. Founded in 1951, the Technical Forum unites more than 9,000 members of the 3M technical community, including theoretical mathematicians, human factors engineers, biological psychologists and scientists from around the world. This culture of cooperation, communication and cross-pollination of ideas among marketers, scientists and other employees generates enthusiasm to share technologies and best practices across more than 35 operating divisions and 30 research labs around the world.

Every year, 3M holds its Tech Forum event where all 9,200 members of the 3M technical community from around the world gather together to share ideas.

“Every company seeks the keys to innovation, but few find them. Over the decades, 3M learned how to be innovative and today the company uses that skill to great competitive advantage.”

— Jerry I. Porras,
Co-author, *Built to Last*

For more than 100 years,
3M has fostered a culture of
creativity and
new ideas.

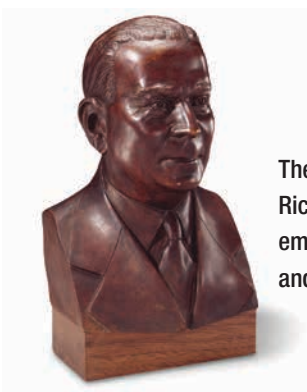
Celebrated Experts:

3M rewards employees who drive innovation forward.

3M was one of the first companies to create a dual career ladder for scientists and managers that offered the 3M technical community the same prestige, compensation and benefits as corporate management. 3M also rewards its innovators through several technical achievement programs, such as the Circle of Technical Excellence & Innovation, Genesis Grants Programme and the Carlton Society. The Carlton Society, named after former 3M President Richard P. Carlton, was created in 1963 to honour top 3M scientists who develop innovative new products and contribute to the company's culture of innovation in myriad ways. To date, more than 160 scientists have been inducted into the Carlton Society, which serves as an enduring reminder that innovation is cherished throughout 3M and remains integral to the company's success.

“Innovation is more than just a bright idea; it is an idea that gets implemented and has a real impact. In other words, somebody has to make it happen.”

— Ernest Gundling,
Author, *The 3M Way to Innovation:
Balancing People and Profit*



The Carlton Award, named after President Richard P. Carlton, is given to technical employees who demonstrate innovation and collaborative research.

Carlton Award Recipients



Scott Culler's leadership in innovative technology and product development has re-energised one of 3M's oldest businesses: Abrasive Systems Division. On more than one occasion, his work had game-changing impact on the abrasives industry, specifically with the launches of the 3M™ Trizact™ line of structured abrasive products and 3M™ Cubitron™ II Fibre Discs and Belts utilising new shaped Cubitron™ mineral. Both product lines leverage microreplication technology to achieve precision and performance that are unparalleled by conventional coated abrasives constructions.



Andrew J. Ouderkerk identified and created multilayer optical films — a major new 3M technology product platform. His visionary leadership, creativity, foresight, persistence and guidance resulted in several revolutionary new product families. He created the technology, led development efforts, identified applications and championed new businesses.

Measured Success:

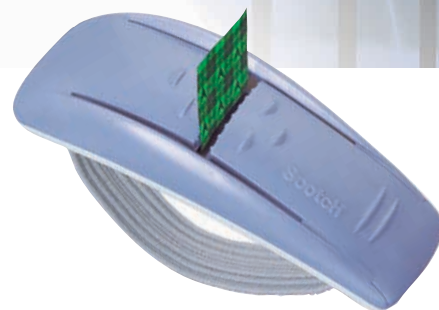
3M measures accountability for investments.

To enhance accountability for 3M's sizeable investments in R&D, the company sets various benchmarks for success and accountability. In addition to measuring financial success derived from new product growth, 3M looks at other areas such as business processes and intellectual property. For example, 3M regularly assesses how quickly a product comes to market, which technologies show the most growth opportunities and the number of patents issued. Through these various measures of accountability, 3M is better able to manage the return on investment for processes related to innovation.

Customer Connection:

3M develops products tied to unmet — and often unarticulated — customer and consumer needs.

Sometimes, the most successful new products arise from an unmet — and sometimes unarticulated — customer or consumer need. 3M stays ahead of the curve by regularly conducting empirical research and maintaining strong relationships with customers and consumers on a regional, national and global scale. In fact, 3M has more than 30 Innovation/Customer Technical Centres around the world that are dedicated solely to conducting innovation processes with customers. Scientists and researchers observe behaviours, identify needs and take their thoughts back to the lab to marry new ideas with sophisticated technologies to ignite the next spark of innovation.



3M introduced the Scotch® Pop-up tape dispenser with pre-cut strips of tape after observing consumers lining up strips of tape when gift-wrapping.



After observing college students switch between tasks of marking pages and highlighting text in their books, 3M innovators developed a “2-in-1” solution with the Post-it® Flag+Highlighter to help aid productivity when studying. The invention has since led to an entire product line of writing tools from the Post-it® brand.



Innovation/Customer Technical Centres

Argentina	Philippines
Australia	Poland
Brazil	Russia
Canada	Singapore
China	South Africa
Colombia	Taiwan
France	Thailand
Germany	United Arab Emirates, Dubai
Iberia	United Kingdom
India	USA
Indonesia	Venezuela
Italy	Vietnam
Japan	
Korea	
Malaysia	
Mexico	
Netherlands	
Peru	

Igniting the Spark of Innovation Around the World

3M operates laboratories in over thirty countries and has more than 30 Innovation/Customer Technical Centres around the world. These Centres draw upon 3M's global R&D strength and 46 technology platforms to engage and collaborate with customers — putting innovations to work to help to meet their needs.



3M Historical Timeline Highlights:

For more than 100 years, 3M has been a pioneer in innovation and the advancement of new technologies.

1900s

- 1902 3M founded in Two Harbors, Minnesota, on 13 June, when five founders sign articles of incorporation.
- 1906 First sandpaper sale to South Bend Toy Co. totals \$2.
- 1907 3M hires 20-year-old business student, William L. McKnight, who later became 3M's president and first chairman of the board.

1910s

- 1916 First 3M laboratory established; 3M Headquarters moves to St. Paul, Minnesota.
- 1919 Annual sales exceed \$1 million.

1920s

- 1921 3M Wetordry™ Waterproof Sandpaper — the world's first water-resistant coated abrasive — is patented and introduced.
- 1925 Richard G. Drew, a young lab assistant, invented Scotch® masking tape and the Scotch® brand tape product line was born.

1930s

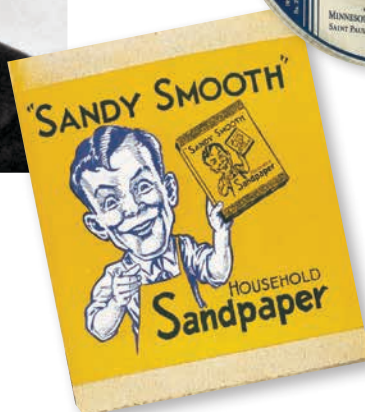
- 1930 Scotch® cellophane first introduced.
- 1936 Adhesives Division established in Detroit; adhesives plant and laboratory opened.
- 1937 The Central Research Laboratory is established to pursue research in technologies with long term potential. Here the first successful test of reflective tape coated with glass beads is conducted.
- 1939 First traffic sign featuring Scotchlite™ reflective sheeting erected in Minneapolis.

1940s

- 1945 Supported by Bing Crosby, 3M Sound Recording Tape revolutionises the entertainment industry.
- 1947 New plants opened in Hutchinson, Minnesota (tape); Los Angeles, California (adhesives); and Little Rock, Arkansas (roofing granules).
- 1948 3M's first nonwoven product — decorative ribbon for gifts introduced.

1950s

- 1951 3M establishes its International Division; new companies are created in Australia, Brazil, Canada, France, Germany, Mexico and the United Kingdom.



1960s

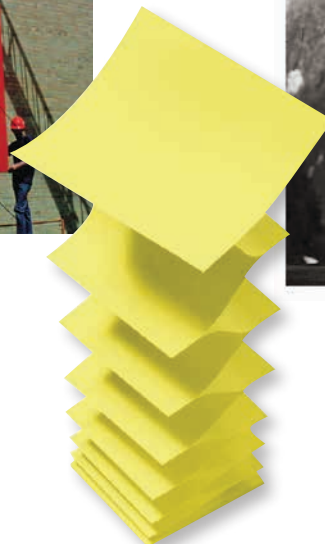
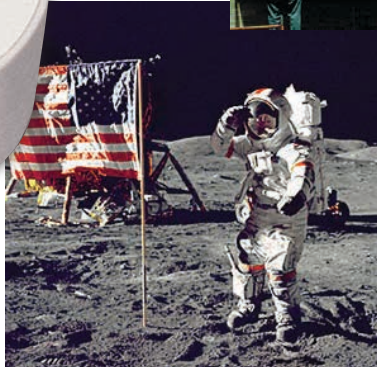
- **1953** 3M breaks ground for first new corporate headquarters (3M Centre), building on a 325-acre site east of St. Paul.
- **1954** RCA uses Scotch magnetic tape to record TV programmes for the first time.
- **1954** U.S. Post Office fleet vehicles carry Scotchlite™ reflective decals for traffic safety.
- **1956** 3M introduces Scotchgard™ fabric and upholstery protector to the textile industry.
- **1960** Micropore™ surgical tape, the first hypo-allergenic tape, is introduced and transforms 3M Health Care business.
- **1961** Manufacturing plants established in 12 countries: Argentina, Australia, Brazil, Canada, Colombia, United Kingdom, France, Germany, Japan, South Africa, Spain and Mexico.
- **1961** Scotch® Magic™ transparent tape introduced.
- **1963** The Carlton Society is created to honour career technical contributions.
- **1967** 3M develops the first disposable facemasks and respiratory protection products.

1970s

- **1969** 3M products are used in the first moon walk on 20 July; Astronaut Neil Armstrong leaves a footprint on lunar dust in boots made from Fluorel™ synthetic rubber from 3M.
- **1970** New products include Scotchban™ Paper Treatment to protect food packaging and 3M box sealing tapes.
- **1973** Former 3M president William L. McKnight retires from the Board of Directors, ending 66 years of service to 3M.
- **1977** 3M Consumer Product Group established.
- **1978** Red 3M logo introduced.
- **1979** Thinsulate™ Thermal Insulation introduced.

1980s

- **1980** Canary Yellow Post-It® Notes are introduced nationally in the United States.
- **1984** 3M and NASA announce joint research programme exploring manufacturing in space; In November, first 3M research experiments are conducted on space shuttle Discovery.
- **1984** Genesis programme announced to encourage technical entrepreneurship in research and new product development.

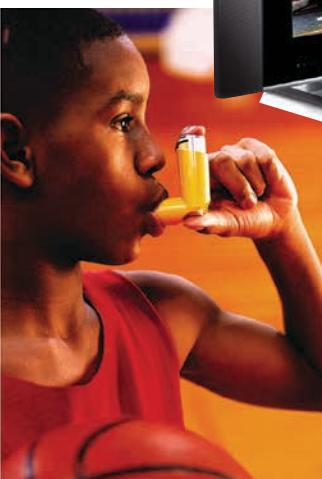


1990s

- 1985 First refastenable nappy tapes introduced by 3M.
- 1985 Academy of Motion Picture Arts and Sciences gives 3M a Scientific Engineering Award for magnetic film that improves audio capabilities of movie soundtracks.
- 1985 The U.S. Food and Drug Administration approves the sale of 3M's Tambocor™, a drug that controls irregular heartbeats.
- 1988 3M is worldwide sponsor of the Olympic Games.
- 1990 3M introduces Pacing Plus product development programmes that receive priority funding to speed product development.
- 1991 3M introduces Scotchshield™ window film, shatter-resistant, heat- and cold-resistant window protection.
- 1995 3M receives the National Medal of Technology — the highest award bestowed by the U.S. president for technological achievement.
- 1995 3M introduces the first metered dose asthma inhaler free of ozone-depleting chlorofluorocarbons.

2000s

- 1997 Dental Products Division receives the Malcolm Baldrige National Quality Award, the most coveted quality award in American business.
- 2000 3M grows portfolio of light management products that make electronic displays easier to read.
- 2001 3M Acceleration Program introduced to generate greater returns from R&D.
- 2002 3Mers around the world proudly celebrated 3M's 100th anniversary as a Century of Innovation.
- 2002 Minnesota Mining and Manufacturing Company officially changes its name to 3M.
- 2008 3M scientists develop a breakthrough ultra-compact, LED-illuminated projection engine for integration in personal electronic devices.
- 2012 3M and Gossamer Space Frames unveil the world's largest aperture trough using 3M™ Solar Mirror Film 1100 for concentrated solar power.



Michael Johnson wins gold in the 2000 Olympics' 400-metre sprint wearing shoes made from 24-carat gold 3M™ Scotchlite™ Reflective Material developed by 3M.

100
A CENTURY
of INNOVATION



Our Vision

3M Technology Advancing Every Company

3M Products Enhancing Every Home

3M Innovation Improving Every Life





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